



Endourology

Appendiceal vesical fistula first presenting as giant bladder calculi: A case report and review of literature

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ABSTRACT

A 34-year-old man was admitted to the hospital presenting repeatedly urinary urgency for 3 years and yellow-green lithotripsy foreign body in urine for 1 month. Initially, he was diagnosed with a giant bladder calculi. After a cystoscopy exam and a lithotripsy for bladder calculi, Appendiceal vesical fistula was finally diagnosed and treated with a laparoscopic surgery. We report a rare case of appendiceal vesical fistula, first presenting as giant bladder calculi, and successfully treated with minimal invasive surgery. We report this case and reviewed literature to improve the understanding of this disease and reduce misdiagnosis and missed diagnosis.

1. Introduction

Urinary bladder calculi are mainly caused by factors like bladder outlet obstruction, neurocytes, chronic inflammation, bladder diverticulum, and secondary upper urinary tract stones. Typical symptoms include complex urinary tract infections, urinary retention, and hematuria. However, young men with giant bladder calculi should consider the possibility of anatomical or metabolic abnormalities. Appendiceal vesical fistula (AVF) refers to a chronic inflammatory condition, constituting only 5 % of gastrointestinal enterovesical fistulas, and it is also a rare sequela of appendicitis.¹ Potential causative factor, other than acute or chronic appendicitis, include Crohn's disease, radiation enteritis, appendiceal papillary adenoma, appendiceal diverticulitis, appendiceal cystadenocarcinoma, and carcinoid tumors.

However, the development of AVF requires specific anatomical factors. Due to the presence of a barrier between the bladder and the appendix in women, the disease is more prevalent in men aged 10–40 years.² The main symptoms of AVF are complex urinary tract infections, accompanied by dysuria and pneumonia. Occasional symptoms like pneumaturia and fecaluria may also be present. *Escherichia coli* and *Klebsiella* are the most detected bacteria in urine routine tests. The likelihood of accurate diagnosis at the initial presentation is relatively low. Common diagnostic methods include CT scans, MRI, retrograde cystography, cystoscopy, barium meals, and so forth.

2. Case description

A 34-year-old male with a 3-year history of urinary pain and urgency, exacerbated before bedtime, presented at our hospital. He experienced 10–20 urination episodes daily, sometimes passing yellow-green lithotripsy foreign bodies. His urine contained gravel and yellow-green soft matter but no significant low back or abdominal pain. Abdominal CT imaging revealed bladder calculi (Fig. 1). Transurethral laser lithotripsy was performed the following day, after ruling out contraindications. Intraoperative findings showed a full bladder with small bubbles and trabecular compartments in the posterior wall. Post-surgery, a small yellow-green residue was noticed in the urinary catheter, and the patient had watery stools. Considering the symptoms, an intestinal fistula was suspected. No canal shadow was detected in the rectum, bladder, and prostate magnetic resonance plain scan. Barium meal and colonoscopy examinations showed no abnormalities. Cystography revealed leakage of linear contrast agent from the right posterior parietal wall, with the ascending colon involved. The colon was found to be communicating with the contrast agent. The bladder was full, without any filling defect (Fig. 2). The patient then underwent laparoscopic exploration, including gastrointestinal fistula resection, appendectomy, partial cystectomy, and urinary tract repair. During the procedure, the pelvic floor, cecum, and appendix were meticulously exposed (Fig. 3). The postoperative diagnosis revealed: 1. Appendiceal vesical fistula 2. Bladder diverticulum. Post-operatively, urine was successfully evacuated, and no abdominal distension, pain, or difficulty

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Fig. 1. The initial urological CT scan revealed the presence of massive bladder calculi.

in defecation was experienced on the first postoperative day.

The pathological findings revealed inflammatory lesions consistent with chronic appendicitis. The appendix displayed a smooth surface, a fecalith-filled lumen, and no perforation (Fig. 3).

3. Discussion

The AVF's primary symptoms include complicated urinary tract infections, dysuria, and pneumonia. Occasionally, symptoms like pneumaturia and fecaluria may also manifest. *E. coli* and *Klebsiella* are the most common bacteria present in urine routine tests.³ At the initial evaluation, the challenge of accurate diagnosis is amplified. Common diagnostic methods encompass CT, MRI, retrograde cystography, cystoscopy, barium meal, etc.

The patient, a young man with giant bladder calculi and severe infection, presented with a preoperative complicated urinary tract infection, characterized by positive urine cultures for nitrite and *Escherichia coli*. Identification of the source of infection was thus necessitated. During the transurethral bladder lithotripsy, the surgeon's intraoperative visual field was significantly compromised due to a severe bladder infection and the presence of a large bladder stone. Consequently, no apparent fistula was observed during the procedure, only subtle formation of small bubbles on the posterior wall of the bladder could be discerned. The detection of minute air release from the posterior wall during transurethral surgery indicated an indeterminate bladder fistula. Postoperative calculi analysis revealed an ammonium phosphate hexahydrate calculi, and the patient developed watery stool. Given the possibility of an intestinal fistula, the final diagnosis was established after cystography suggested an intestinal leak. However, during laparoscopic exploration, obvious bladder and appendiceal

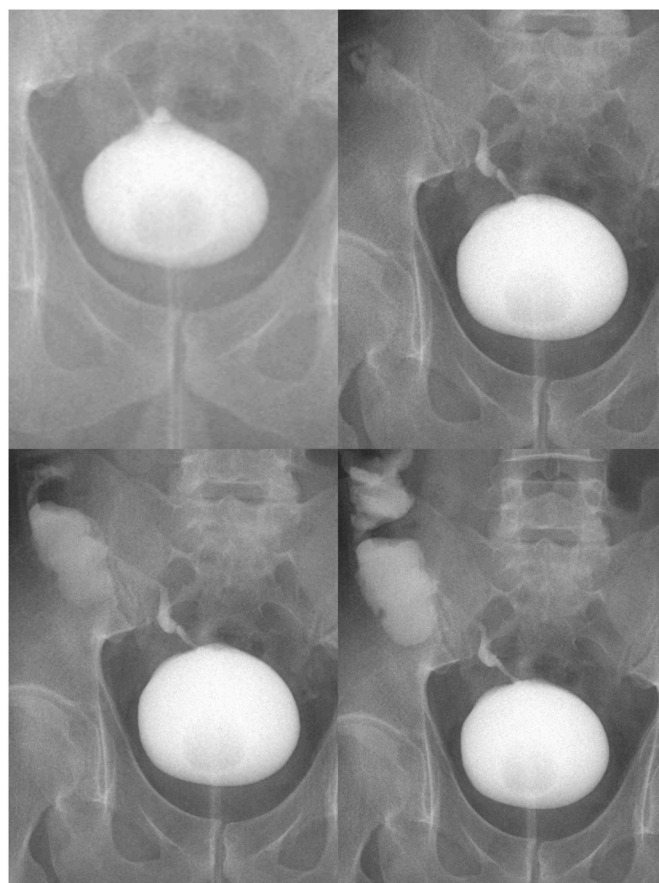


Fig. 2. The cystography demonstrated a linear contrast agent leakage from the right posterior parietal wall of the bladder, progressing towards the ascending colon, which was found to be communicating with the linear contrast agent. The bladder was observed to be filled, with no evidence of a filling defect.

fistulas were detected, and an AVF was diagnosed.⁴ In this case, there were no abnormalities in preoperative CT, follow-up MRI, colonoscopy, and gastrointestinal barium meal examination, indicating the high complexity of diagnosing this fistula.

In this case, we considered the precipitating cause to be chronic inflammation caused by chronic appendicitis with an appendicolith. This condition repeatedly stimulated the bladder wall, leading to tissue thickening and edema. On admission, the patient presented with no apparent tenderness or rebound pain in the right lower quadrant, and the abdominal signs may be obscured by bladder irritation. In recent years, the patient has occasionally experienced lower abdominal discomfort; however, they did not pay heed to it nor underwent relevant examinations. The patient only sought medical attention when obvious urinary tract irritation manifested. The patient's complicated infection, bladder calculi, and other urethral symptoms were all consequences of long-term accumulation of intestinal fecal residues, which passed through the internal fistula into the bladder. However, during transurethral cystectomy, when the bladder pressure increased due to saline irrigation by the surgeon, the patient experienced distinctly watery stool, suggesting the presence of fluid flowing into the intestine through the fistula. Nonetheless, we only considered fistulas to the intestine when bladder pressure escalated. Prolonged bladder urine fistula to the intestine might induce related metabolic disorders, which could potentially lead to complications such as severe hypokalemic and hyperchloremic metabolic acidosis.⁵

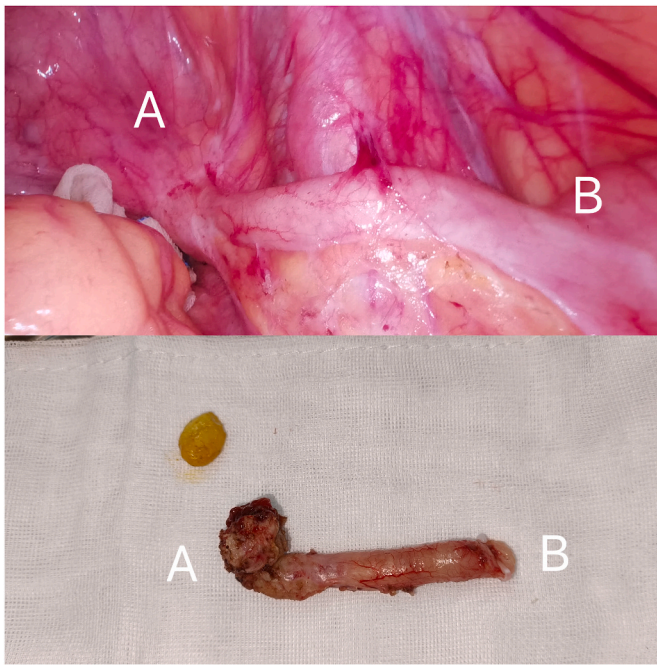


Fig. 3. Intraoperative laparoscopic findings show a long appendix, which is firmly attached to the right side of the urinary bladder dome. A: bladder, B: cecum.; The post-operative specimen surface appeared smooth, with the cavity filled by fecal stones, and no perforation was detected.

4. Conclusion

The suspicion of a Vesico-digestive fistula a warrant the performance

of cystography and abdominal CT. Upon identification of AVF, surgical resection of the fistula and bladder repair become imperative. Laparoscopic surgery should be the preferred modality.

CRediT authorship contribution statement

Chen Wang: Writing – original draft, Writing – review & editing. **Ye Wu:** Investigation. **Xianya He:** Investigation. **Guangqing Song:** Resources. **Yuanwei Li:** Writing – review & editing. **Qiang Lu:** Resources, Writing – review & editing.

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